Market Dynamics

Volume 7, Issue I23

December 26, 2008

Performance Management System

A Mathematical Herd

Portfolios heavy with under-performing stocks almost never outperform the market. Ignat's Law

There was a very interesting article on Quants this week on www.financialweek.com

The link to that article follows
http://www.financialweek.com/apps/pbcs.dll/article?AID=/20081222/REG/812229997/1036

Click or Copy and paste the link into your browser to view the article.

A collection of recent newsletters is available on the web site.

Wall Street seems to have created a new form of crowd following behaviors. This is what one economics professor termed a "mathematical herd." This herding behavior had a devastating effect on Wall Street over the past year.

This behavior is the result of institutional investors who manage their portfolios based on the predictions of the future of a market or a stock produced by a mathematical model. These "Quant" models enjoyed considerable success for a while but their very success resulted in overcrowding that caused the market to change in unexpected ways.

The past predictive power of the models led managers to strongly believe that they knew something about the future that they actually did not know and could not know. It seems that their success led to a false sense of confidence in the models that led to excessive risk taking through the use of excessive leverage. That leverage led to excess returns when the model was working, but produced unusual and unexpected losses when the predictions of the models started to fail. And they seem to have failed all together.

Almost all predictive models rest on an assumption that the future will be largely like the past. This is a valid assumption until the behavior of the market starts to change. It would be silly for a Quant to build a model based on factors that had never happened before but that seems to be the Achilles Heel of this sort of modeling.

An important part of the Quant modeling process involved the statistical analysis of the factors that went into the model. These models expressly factored in the characteristics of these statistical distributions. It was often believed that these distributions could be depended upon to provide a reliable prediction of the future behavior of a market or of a security. But experience shows that the statistical distributions could change in dramatic ways that completely invalidated the reliability of the predictions of the model. The inherent assumption that the statistical distribution would remain fixed was the root cause of the problem.

Statistical analysis of price data for individual stocks shows that the general shape of the distribution can be the same, usually a normal, bell shaped curve, but the characteristics of the distribution could be very different from one time period to the next. The distribution of price data for an individual stock can show a very positive mean for one time period and a highly negative mean for a different time period. In addition, the standard deviation can change significantly from one time period to the next. Not only that, the distribution can show a highly positive degree of skewness in one time period and no skewness or negative skewness in another time period.

Not only can the distributions change, but the independent variables can change as well. A variable that was crucial to the output of the model in one time period may have little or no bearing on the variable's ability to predict in a different time period.

It appears that the search for the "holy grail" will continue in the future but it seems that the love affair with Quant models has cost too much capital and resulted in the collapse of too many major financial institutions to remain unscathed. Institutional managers have learned first hand of the dangers of excessive leverage and will almost certainly be unwilling to leverage portfolios has heavily in the future as in the recent past. This whole episode has probably produced a healthy skepticism about the reliability of quantitatively based predictions.

This not to say that quantitative methods have no place on Wall Street but a more common sense approach to the use of mathematical models will probably control their applications in the future.

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